

ENVIRONMENTAL
PROTECTION
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WORK PLAN
FOR
SOIL AND GROUNDWATER SAMPLING
AND
MONITORING WELL INSTALLATION

5930 College Avenue
Oakland, California

BY
GOLDEN GATE TANK REMOVAL

Project No. 7335
April 1, 1997



John Carver
CE 23772
Expires December 31, 1997

X

TABLE OF CONTENTS
5930 COLLEGE AVENUE
WORK PLAN

INTRODUCTION	1
Purpose	1
Scope	1
Site Location and Description	2
Site History	2
Site Geology, Soil Conditions and Hydrogeology	3
PLANNED WORK	3
Sequence	3
Pre-field Activities	4
Soil Borings	4
Soil Sampling During Drilling	5
Water Sampling During Drilling	5
Analysis of Samples Obtained During Drilling	5
Groundwater Monitoring Well Installation	5
Well Development	6
Groundwater Sample Collection	6
Groundwater Sample Analyses	7
Data Interpretation and Soil and Groundwater Report	7
Schedule	8
Report Distribution	8
ATTACHMENTS	

INTRODUCTION

Purpose

This work plan was prepared in response to the Alameda County Health Care Services (HCS) Letter of December 30, 1996 requiring a work plan describing additional soil and groundwater investigation. The letter requested the following be addressed:

Define the lateral and vertical extent of soil contamination.

Verify if groundwater has been contaminated due to the petroleum hydrocarbon release.

If groundwater has been significantly affected, then permanent monitoring wells may have to be installed to delineate the groundwater plume.

The purpose of this work plan is to describe the procedures and methods to be used in the initial investigation of the subsurface conditions beyond the limits of the tank removal and additional excavation. Information collected will be used to define any soil and groundwater contamination at the site. The results of the work described in this Work Plan may be used to identify the need for further work or if the site can be closed. The soil sampling and profiling along with any monitoring well installation and periodic monitoring are part of the continuing work required by the State Water Resources Control Board's Leaking Underground Fuel Tank (LUFT) manual and The TRI-Regional Board Staff Recommendation for Preliminary Evaluation and Investigation of Underground Tank Sites when evidence of an unauthorized fuel release has been found.

The site and the results of the tank removal and soil over-excavation performed by Golden Gate Tank Removal (GGTR) during 1996, were discussed with Ms. Madulla Logan, Hazardous Materials Specialist of the HCS, the agency responsible for continued work at this site. Because of the access conditions and physical conditions of the tank removal area, the proximity of the building, a neighboring building, the traffic and vehicular traffic on College Avenue, GGTR determined the Scope of Work described below. If the conditions encountered during the investigation are favorable, the leaking underground fuel tank case may be able to be closed on the basis of the work performed with no further remediation required.

Scope

The scope of this work plan includes descriptions of:

- Previous Work carried out at the site.
- Required pre-field work activities and permitting.
- Drilling and sampling three borings with "minute man" portable equipment.
- Drilling and sampling one boring with conventional drilling equipment.

- Soil and groundwater sampling equipment and techniques.
- Soil and groundwater sample handling and transportation.
- Coverting the one boring drilled with conventional equipment to a groundwater monitoring well.
- Management of soil cuttings, well development water and purge water.
- Monitoring well installation including annular seal, surface treatment, and surveying.
- Well development.
- Physical monitoring of the well.
- Well purging..
- Sample analyses.
- Data interpretation and reporting procedures.

Site Location and Description

The subject site, 5930 College Avenue, is located along the east side of College Avenue between Harwood Street and Chabot Road in Oakland, California. The general location of the site is shown on the Vicinity Map, Figure 1 of Appendix A. The project site consists of a commercial property with a building used for auto repair the front 75% of the site, and a paved/unpaved storage area occupying the rear of the site. The site is an active auto repair shop with no active fuel distribution facilities. The site, building, adjacent street and property boundaries are shown on the attached Figure 2.

Site History

Two underground storage tanks were removed from the site during 1996 by GGTR.

The following summary shows the tank designations, size, type of construction and contents. The tank designations and locations are shown on the attached Figure 3.

Designation	Construction	diameter (feet)	length (feet)	size (gallons)	contents
TANK 1	steel	4	7	675	gasoline
TANK 2	steel	4	3.5	340	waste oil

The ages of the tanks are unknown but are believed to be between 40 and 60 years old. During the removal there was evidence of a leak and a program of over-excavation of contaminated soil was carried out by GGTR. The removal and over-excavation was documented in the GGTR report dated October 11, 1996.

The following Chronology shows the significant work carried out at the site.

CHRONOLOGY

08/06/96 Tanks 1 and 2 were removed and samples taken.
08/15/96 A Work Plan was published by GGTR for additional excavation and soil disposal.
09/30/96 Additional excavation performed.
10/01/96 Last of additional excavation soil disposed of at a Class II facility.
10/11/96 TANK REMOVAL REPORT published by GGTR.
12/30/96 HCS published letter requiring soil and groundwater investigation.
03/10/97 GGTR authorized to prepare a Work Plan for additional investigation.

A total of 11 soil samples have been taken from the site. These samples were all documented in the Tank Removal Report 10/11/96. These samples and results are tabulated on the attached Soil/Groundwater Sampling Data Form. The locations of the samples are shown on Figure 3 and 4.

Site Geology, Soil Conditions and Hydrogeology

The site is located in the transition area between the Berkeley hills and the shores of San Francisco Bay. Soil at the site lies within colluvium and alluvium derived from the Berkeley Hills to the east and possible San Francisco Bay sediments to the west.

Soils encountered during the tank removal were primarily sands, with a varying amount of silt and clay. No groundwater was encountered during the tank removal. The exact depth to groundwater is unknown but should be relatively shallow, between 15 and 25 feet. The regional groundwater flow direction in the immediate vicinity of the site is thought to be toward the southwest, the direction of San Francisco Bay, and topographically downhill.

PLANNED WORK

Sequence

The following is the planned sequence of activities at the site:

- Drill four borings as shown on the attached Figure 5.
- Collect soil and water samples from each boring.
- Analyze all samples.
- Immediately after drilling convert the northernmost boring to a groundwater monitoring well.
- Develop the well.
- Observe, measure, purge and sample the newly installed monitoring well.
- Analyze the water sample for gasoline and waste oil related contaminants.
- Prepare a summary report of the work.
- Determine monitoring criteria for the newly installed groundwater monitoring well.

Pre-field Activities

GGTR will obtain all permits which are required for the drilling, sampling and monitoring well installation. These permits will include a drilling permit from Zone 7 of the Alameda County Water District, an excavation permit from the Oakland Office Department of Planning and Building, and a parking permit from the Oakland Traffic Control Department. The property owners and tenants will be notified of all field work dates and the precise locations so access is available. Additionally, Ms. Logan of the HCS will be notified of all scheduled activities. Underground Service Alert will be notified at least 72 hours before any drilling so that any utilities are located. GGTR will arrange and schedule all drilling, surveying and laboratory subcontractor services. Appropriate drill rigs will be scheduled and a State Certified Laboratory notified of the impending samples.

Soil Borings

The soil borings will be drilled at the approximate locations shown on Figure 5, attached. The boring locations were selected to be within the property, or in public right-of ways, with the minimal disturbance on neighbors and the general public. Borings 1, 2, and 3 will be drilled using low overhead equipment to allow access in the building and under the tree. Boring 4 will be located near the tank removal excavation and will be drilled with conventional drilling equipment. The conventional equipment can then be used to install a groundwater monitoring well. These locations will provide additional data regarding the extent of soil and groundwater contamination. Boring 4 is to be within the zone of influence of any spreading gasoline or waste oil contamination. The assumed downgradient direction from the tank would result in locating a well greater than 10 feet from the tank and the well would be in the College Avenue pavement.

The locations were selected to be accessible to equipment and away from known utilities. Actual locations may depend on particular access conditions and the exact drill rig configuration as well as on any discovered underground obstructions. Soil boring 4 will be converted to a 2 inch diameter groundwater monitoring wells immediately after drilling. The other three borings will be grouted closed after sampling is complete. All down-hole equipment will be steam cleaned before arriving on site and before leaving to prevent off-site contamination.

All drilling will be by a California Licensed Water Well Drilling Contractor (C57), Boring 4 will be done with a conventional truck mounted drill rig using eight inch diameter hollow stem augers. The other three borings will be drilled using a "minute man" portable drill rig equipped with 3 inch diameter flight augers. All drilling be logged under the supervision of John Carver, Registered Civil Engineer 23772. Soil encountered will be classified in accordance with the Unified Soil Classification System by observing the samples and cuttings. The soil cuttings from each boring will be stockpiled and stored on-site pending analytical results.

Soil Sampling During Drilling

The borings will be sampled starting at about 5 feet below the surface. Samples will then be taken at 5 foot intervals and at any significant lithographic changes detected during drilling down to first encountered groundwater. Soil sampling during the drilling will provide additional information regarding the extent of soil contamination.

Undisturbed soil samples will be obtained by driving a split-barrel sampler into the "undisturbed" soil beyond the augers. The soil samples will be contained in brass tubes. Driving energy will be provided by a standard hammer falling a set distance in accordance with ASTM procedures. The number of blows required to drive the sampler a given interval (N value) will be recorded and used to evaluate the consistency of the sampled soil. The sampler and brass tubes will be cleaned between samples using soap, TSP, and clear water to prevent cross or down-hole contamination.

As samples are obtained, the brass tubes will be covered with aluminum foil, capped and sealed with airtight tape. The samples will then be labeled, placed in a chilled environment for transportation to the analytical laboratory.

Water Sampling During Drilling

Water samples will be taken from the three "minute man" soil borings after groundwater is encountered. After the last soil sample is obtained, a piece of PVC will be placed in the boring. Approximately two volumes will be removed through the PVC as a purging measure. A water sample will then be obtained through the PVC using a disposable bailer. The samples will be placed in appropriate containers and maintained in a chilled environment for delivery to the laboratory.

Analysis of Samples Obtained During Drilling

A Chain-of-Custody form will be initiated by GGTR personnel at the time of sampling and will accompany the soil and water samples to a state certified laboratory using California Department of Health Services approved methods. All soil and groundwater samples will be analyzed for:

- Total Petroleum Hydrocarbons as Gasoline (TPH-G),
- Volatile aromatic hydrocarbons Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX),
- Total Recoverable Petroleum Hydrocarbons (TRPH).

MTBE

Groundwater Monitoring Well Installation

After sampling the boring B4 down to the groundwater level, it will be extended about 5 more feet. The boring will be then be converted to groundwater monitoring well. The

monitoring well will be installed by the Licensed C57 driller used to drill the boring. The well will be constructed within the 8 inch diameter hollow stem auger. It is anticipated that the total well depth will be between 20 and 25 feet. In any case, the well will not extend more than 10 feet beyond the first encountered groundwater in order to preclude drilling into any other underlying aquifers.

The monitoring well will be constructed of 2 inch diameter, flush threaded, Schedule 40 Polyvinyl Chloride (PVC) factory slotted well screen and blank casing. A screw cap which will act as a sediment trap will be installed at the bottom of the well and a locking slip cap will be installed at the top. The top of the well will be secured and protected by a water tight monitoring well vault installed about 2 inches above the adjacent surface. No glue or solvent will be used in constructing the well.

The PVC well screen, slot size 0.020 inch, and blank casing will be installed within the hollow stem augers. A filter pack consisting of No. 2 or 3 Monterey sand will be placed within the annular space between the casing and borehole as the auger sections are withdrawn. The filter pack will be continually measured with a steel tape to insure that no bridging occurs. The sand will be placed to about 1 foot above the screened interval of the well. A minimum thickness of 1 foot of bentonite pellets will be placed directly on top of the sand pack and hydrated. The remainder of the annular space will be filled with neat Portland cement grout in the presence of a county inspector. The monitoring well vault will then be concreted in place to finish the installation. The attached Figure 6 is a typical detail of the monitoring well installation.

Well Development

The groundwater monitoring well will be developed to clean the well and stabilize the filter pack around the screened interval in order to provide a hydraulic connection between the well and the aquifer. Development will occur at least 72 hours after the wells are installed. The well development will be performed by alternately surging and bailing. Well development will continue until the well water is as free of turbidity and particulate matter as is reasonably possible (generally only until slightly cloudy). Development water will be stored on site in 55 gallon DOT 17E drums labeled as "GROUNDWATER" until analysis of the water is obtained and the proper method of transport and disposal can be determined. Aquifer testing will not be performed unless groundwater contamination is verified by analysis and the aquifer parameters are needed for additional site characterization and remedial action studies.

Groundwater Sample Collection

Following development, the groundwater monitoring well will be allowed to stabilize for at least 24 hours before sampling. Initially the depth to water from the top of the well will be measured to an accuracy of 0.01 feet. The water will then be checked for floating product or iridescent sheen by taking a preliminary water sample with a clear acrylic

bailer. If floating product is observed, the thickness and nature of the product will be noted.

Next, the well will be purged of at least three casing volumes or until the pH, temperature and conductivity measurements of the purge water are essentially stable. One well volume is calculated as the height of water in the casing multiplied by 0.16 gallon per foot for a 2 inch casing. Purging will be carried out by successive use of a teflon bailer. All purged water will be stored in a DOT 17E drum and labeled as "GROUNDWATER" until analysis of the water is obtained and the proper method of transport and disposal can be determined.

The water sample will be collected in disposable clear acrylic bailer and poured directly into laboratory cleaned 40 milliliter volatile organic analysis (VOA) vials to prevent loss of any volatile constituents. The vials will be filled slowly and in such a manner that the meniscus extends above the top of the VOA vial. After the vials are filled and capped, they will be inverted to insure there are no headspaces or entrapped air bubbles. After sealing with a laboratory provided teflon cap, the VOA vials will then be labeled and placed on crushed or dry ice and stored in an ice chest for transportation to the analytical laboratory. Water samples which will be analyzed for extractable compounds will be decanted into laboratory cleaned one liter bottles and will be handled the same as the VOA vials.

A Chain-of-Custody form will be initiated by GGTR personnel at the time of sampling and will accompany the water samples to a state certified laboratory using Department of Health Services approved methods.

Groundwater Sample Analyses

All groundwater samples obtained during the work described in this work plan will be analyzed for the following:

- Total Petroleum Hydrocarbons as Gasoline (TPH-G),
- Volatile aromatic hydrocarbons Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX),
- Total Recoverable Petroleum Hydrocarbons (TRPH).

All analyses will be conducted by a laboratory certified by the State of California.

Data Interpretation and Soil and Groundwater Report

Following the completion of all field work, GGTR will review the data obtained and prepare a Soil and Groundwater Investigation Report. The report will describe the details of the field work, summarize the analytical results, discuss the finding of the initial well monitoring, present conclusions and recommendations.

Any groundwater contamination will be assessed according to guidelines set forth by the Regional Water Quality Control Board LUFT Field Manual, October 1989 and the TRI-Regional Board Staff Recommendation for Preliminary Evaluation and Investigation of Underground Tank Sites, August 1990.

The information obtained during the work described will be used in addressing the full extent of the groundwater and soil contamination at the site. Drawings will be prepared showing both horizontal concentrations of detected compounds in both water and soil.

Schedule

GGTR anticipates beginning the drilling permitting within two weeks of receiving approval to proceed and receipt of the drilling permits. The report described in the preceding section should be available within 2 weeks of receipt of all soil and groundwater analytical results.

Report Distribution

All reports that are prepared during the continuing work on this project will be sent to:

Alameda County Health Care Services
Environmental Health Services
Environmental Protection (LOP)
1131 Harbor Bay Parkway Suite 250
Alameda, CA 94502
Attention: Madullah Logan

California Regional Water Quality Control Board
San Francisco Region
2101 Webster Street, Suite 500
Oakland, California 94612

ATTACHMENTS

**WORK PLAN
FOR
SOIL AND GROUNDWATER SAMPLING
AND
MONITORING WELL INSTALLATION**

**5930 College Avenue
Oakland, California**

**BY
GOLDEN GATE TANK REMOVAL**

**Project No. 7335
March 24, 1997**

Oakland
SOIL/GROUND WATER SAMPLING DATA FORM

Underground Storage Tank Site Address: 5930 College Avenue Project 7189 Sheet 1 of 1

Business Site Name: commercial building at 5930 College Avenue

Description Sample ID (Specify location; ie, tank, pipe, stockpile) and number	Sample Depth (Indicate depth of sample from grade)	Media (soil/water)	Date (Date Sample was collected)	Soil Type (specify if sand, clay, fill, etc.)	Laboratory Results, express in mg/kg unless otherwise specified									
					TPHg	TPHd	B	T	E	X	Lead	TRPH	Cl HC	Other
7189-SP1 stockpile #1	--	soil	8/6/96	sand	ND	ND	ND	ND	ND	ND				
7189-SP2 stockpile #2	--	soil	8/6/96	sand	1.3	ND	ND	ND	ND	ND	79	14,000	*	
7189-T1-N north end of tank 1 (gas)	8 feet	soil	8/6/96	sand	6,000		19	240	76	470				
7189-T1-S south end of tank 1 (gas)	8 feet	soil	8/6/96	sand	8,100		16	240	72	530				
7189-T1-C-10' center of tank 1 (gas)	10 feet	soil	8/6/96	clay	1,200		9.1	68	10	79				
7189-T2-C center of tank 2 (waste oil)	8 feet	soil	8/6/96	sand	560	ND	2.7	16	3.3	33	48	16,000	*	
7189-OE-1 sidewall of excavation	10.5 feet	soil	10/2/96	sand	1,400	ND	9.8	81	14	110		1,700		
7189-OE-2 sidewall of excavation	10.5 feet	soil	10/2/96	sand	840	ND	3.3	51	12	91		320		
7189-OE-3 sidewall of excavation	10.5 feet	soil	10/2/96	sand	ND	ND	ND	0.01	0.02	ND		21		
7189-OE-4 sidewall of excavation	10.5 feet	soil	10/2/96	sand	430	ND	0.93	18	4.6	41		240		
7189-OE-5 bottom of excavation	10.5 feet	soil	10/2/96	sand	1,400	ND	2.2	40	41	120		1,400		
* various positive--see certificates														

TPHg = Total Petroleum Hydrocarbons as Gasoline

BTEX = Benzene, Toluene, Ethylbenzene, Xylene

Cl HC = Chlorinated hydrocarbon compounds

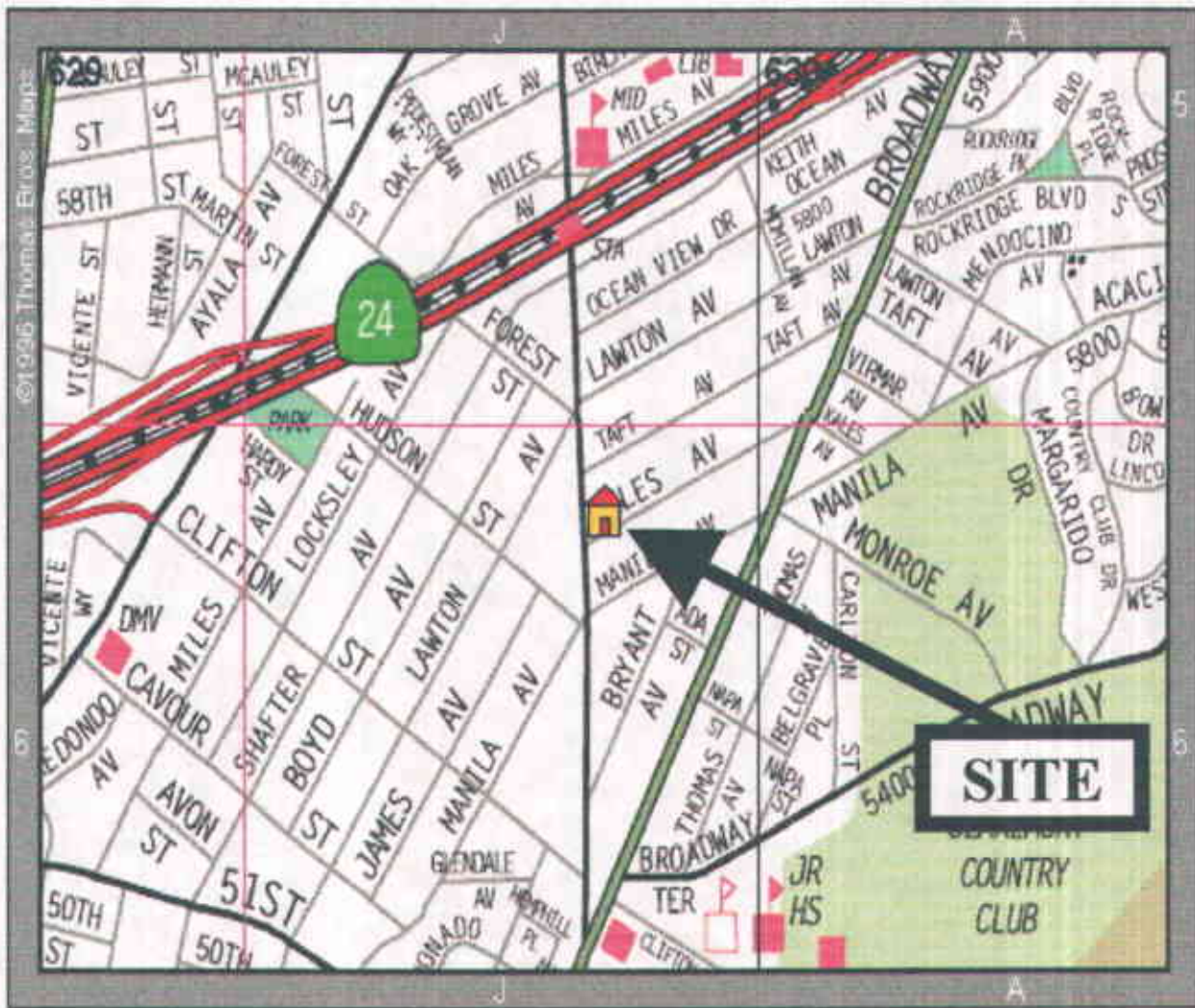
TPHd = Total Petroleum Hydrocarbon as Diesel

TOG = Total Oil and Grease

Other = Semivolatile organic compounds, heavy metals, etc.

List additional analytical results and / or additional samples on a separate sheet

Submit this form as part of the closure final report. Attach soil/ground water sampling location map.



GOLDEN GATE TANK REMOVAL

255 Shipler Street
San Francisco, California 94107

Telephone (415) 512 1555 Fax (415) 512 0964

VICINITY MAP

5930 College Avenue
Oakland, California

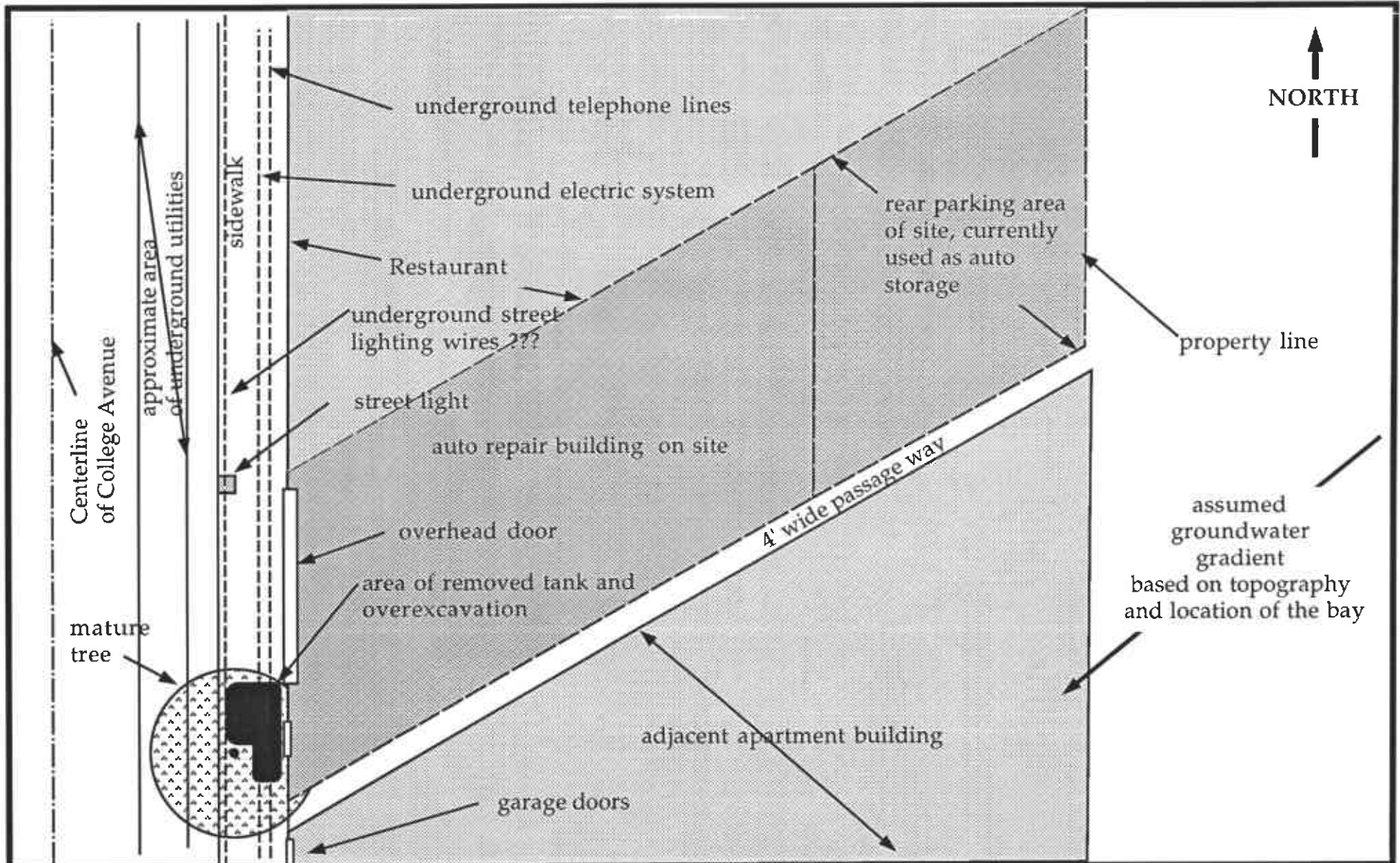
Project 7335

By: eme

Not to scale

April, 1997

Figure 1



KEY

GOLDEN GATE TANK REMOVAL

255 Shipley Street • San Francisco, CA 94107 • (415) 512-1555

Site Plan
5930 College Avenue
Oakland, California

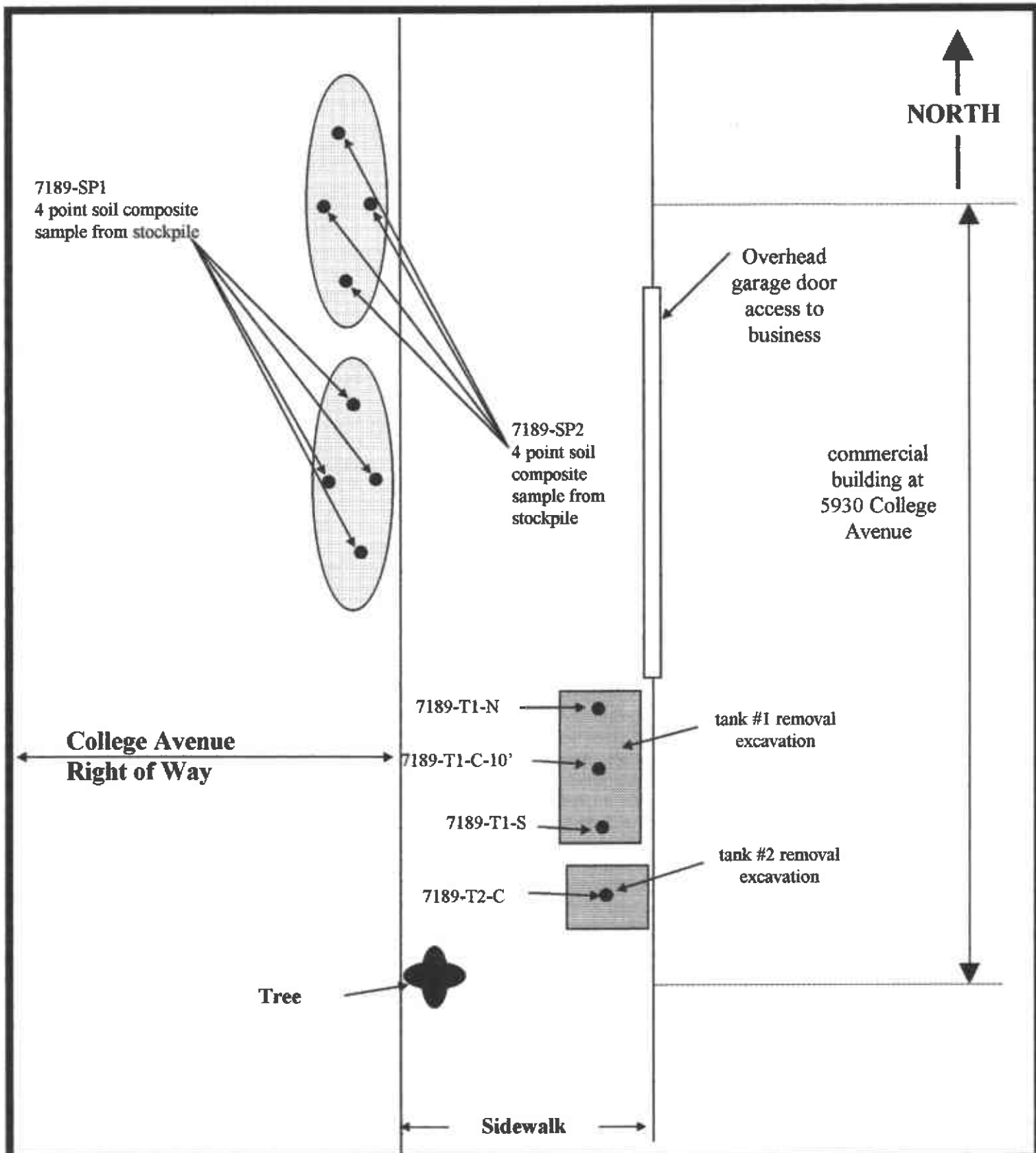
Project Number: 7335

Drawn by: JNC

Scale 1" = 20'

March, 1997

Figure Number: 2



GOLDEN GATE TANK REMOVAL

255 Shipley Street

San Francisco, California 94107

Telephone (415) 512 1555 Fax (415) 512 0964

SITE PLAN

5930 College Avenue

Oakland, California

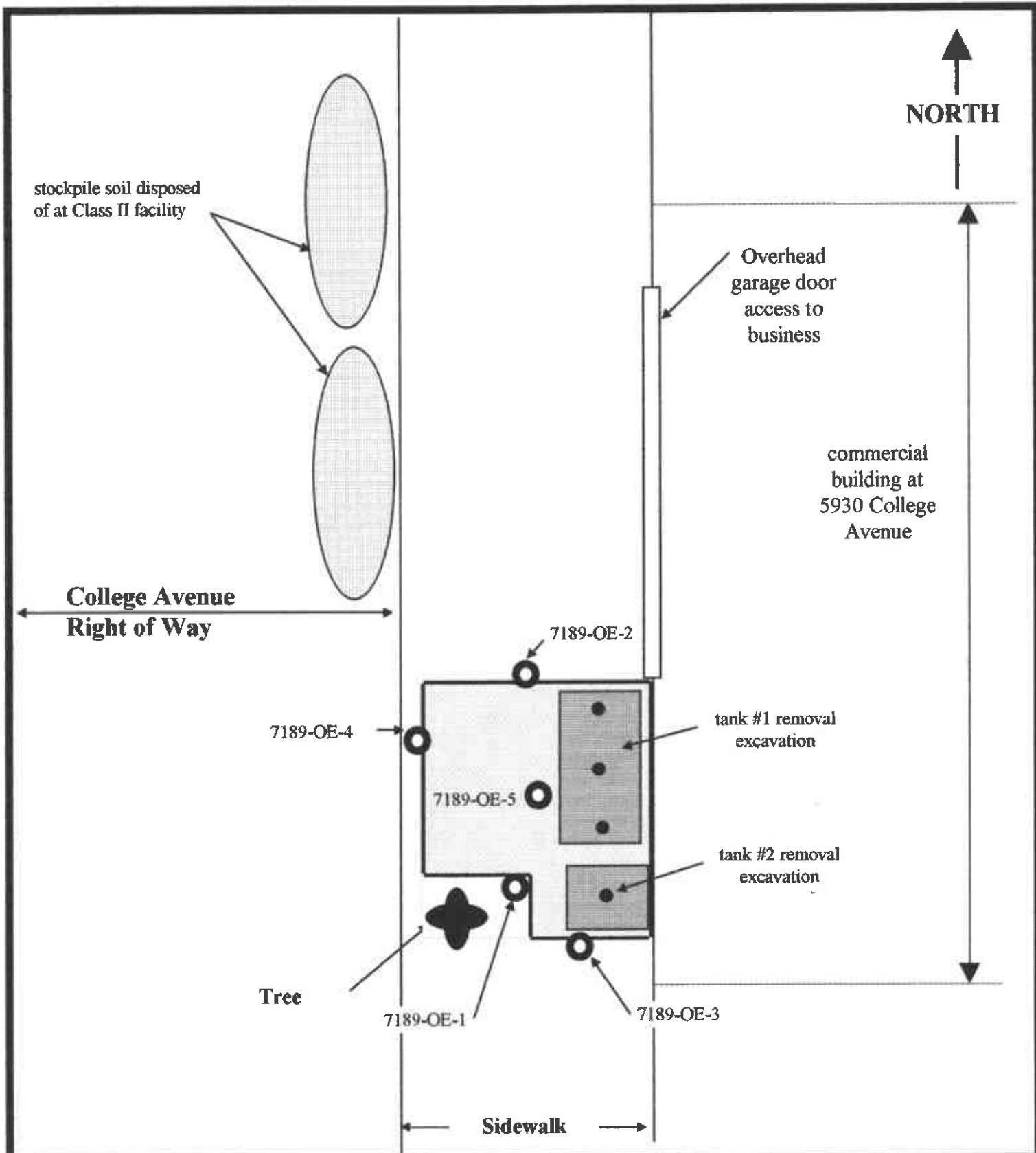
Project Number 7335

April 1997

By: inc

Not to scale

Figure 3



GOLDEN GATE TANK REMOVAL

255 Shipley Street
San Francisco, California 94107

Telephone (415) 512 1555 Fax (415) 512 0964

OVER-EXCAVATION PLAN

5930 College Avenue
Oakland, California

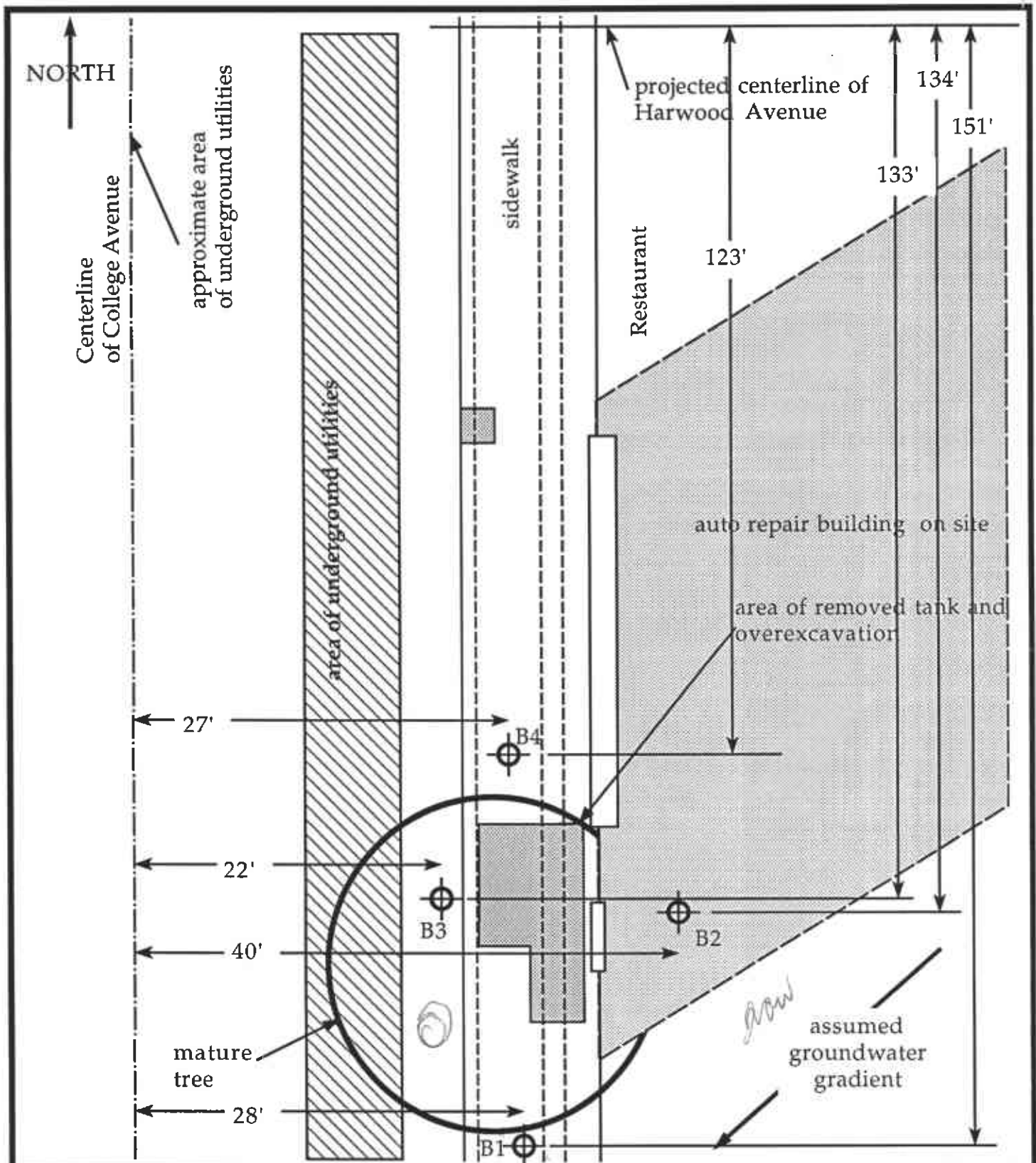
Project Number 7335

April 1997

By: jnc

Not to scale

Figure 4



GOLDEN GATE TANK REMOVAL
 255 Shipley Street, San Francisco, California
 Tel. (415) 512 1555 Fax. (415) 512 0964

Exploration Plan
 5930 College Avenue
 Oakland, California

 Boring or monitoring well location

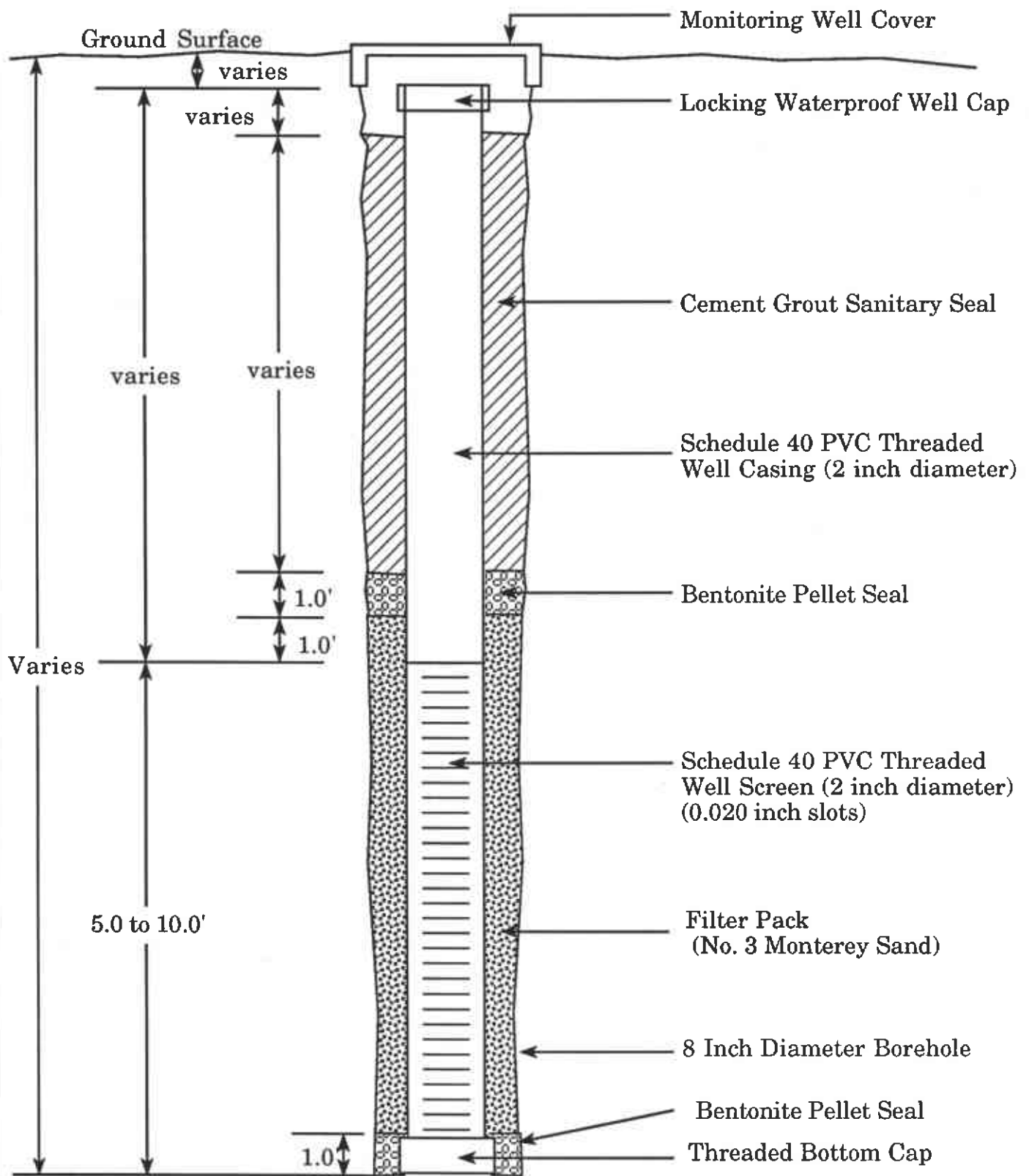
Project Number: 7335

By: JNC

Scale: 1" = 10'

April 1997

Figure Number: 5



<p>GOLDEN GATE TANK REMOVAL</p>	<p>5930 College Avenue Oakland, California</p>	<p>Monitoring Well Installation Detail</p>
<p>Project Number: 7335</p>	<p>Date: April, 1997</p>	<p>Figure Number: 6</p>